REMARKS

This Response is submitted in reply to the Office Action mailed on November 7, 2008. A three-month extension of time fee is submitted herewith. The Commissioner is hereby authorized to charge any fees that may be required or credit any overpayment to the Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 112843-086 on the account statement.

Claims 1, 4-5, 7-9 and 11-21 are pending in the application. Claims 2-3, 6 and 10 were previously canceled. In the Office Action, Claim 6 is objected to; Claims 1, 4-5, 7-9 and 11-21 are rejected under 35 U.S.C. §112 and under 35 U.S.C. §103(a). In response, Applicants amend Claims 1, 13-15 and 21, add new Claim 22 and cancel Claims 11, 12 and 16. The amendments and new claims do not add new matter and are supported in the specification at page 7, [0032]; page 8, [00039]; pages 9-10, [00045], and original Claims 11, 12 and 16. In view of the amendments and for at least the reasons set forth below, Applicants respectfully submit that the rejections should be withdrawn.

In the Office Action, Claim 6 is objected because the status identifier is marked as "previously presented," while the Patent Office asserts that Claim 6 was previously canceled during prosecution of the case. In response, Applicants change the status identifier of Claim 6 to read "canceled" and add new Claim 22. New Claim 22 does not add new matter and is supported in the specification at page 8, [00039]. Applicants request therefore that the objection to Claim 6 be withdrawn.

In the Office Action, Claims 1, 4-5, 7-9 and 11-21 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Office Action rejects these claims for multiple reasons, each of which are discussed below.

First, the Office Action asserts that the method of Claims 1 and 21 contain the same steps and it is unclear whether the method of Claim 1 results in producing an unstabilized protein while Claim 21 results in producing a stable protein. Regarding the result of Claim 1's method steps, Applicants submit that Claim 1 neither recites nor intends the production of an unstabilized protein. On the contrary, an assay produced by the claimed method exhibits excellent long-term durability and therefore is not unstable. Further, Applicants' specification

states clearly that an objective of the present invention is to provide a micro-array with a number of proteins spotted thereon, which shows high stability for all the different proteins of the same array. See, specification, page 4, [00012]. Regarding the steps of Claims 1 and 21, Applicants submit that Claim 1 is distinct from Claim 21 in that Claim 1 recites depositing the spotting solution specifically on one of the discrete analyte-specific regions of the surface of a nonporous solid support while Claim 21 recites depositing the spotting solution generally on a nonporous solid support. In fact, the specification states that the term "discrete analyte-specific region" designates a spot on the solid support represented by a discrete region on the support spaced apart from another location. See, specification, page 6, [00023]. Applicants submit therefore that the claimed methods have distinct process steps and, as a result, do not have the same steps as asserted in the Office Action.

Second, the Office Action asserts that there is insufficient antecedent basis for "the activity" of the captured protein of Claim 1. In response, Applicants delete "the" from Claim 1.

Third, the Office Action asserts that Claims 13 and 14 are inconsistent in that Claim 1 recites a dry condition while Claim 13 recites "air conditions" and Claim 14 recites "an inert gas condition." Applicants respectfully disagree. Applicants note that Claims 13 and 14 depend from Claim 11, which recites a final step of storing the micro-array between 0 and 8°C. Applicants also note that since Claims 11 and 12 have been incorporated into Claim 1, Claims 11 and 12 are now canceled and Claims 13-15 are amended to depend from Claim 1. As described in [00045] of Applicants' specification, this storage of the protein micro-array may be performed under air (Claim 13) or under an atmosphere of inert gas (Claim 14). Therefore, the "storage" elements of Claims 13 and 14 derive from the final step of storing the micro-array of former Claim 11, which provides the "dry conditions" recited in Claim 1.

Fourth, the Office Action asserts that the claim language "all said captured proteins" of Claims 16 and 17 is inconsistent with "a protein" of Claim 1. Applicants first note that Claim 16 has been canceled. Further, Applicants amend Claim 1 for clarification purposes to recite, in part, contacting a C_5 to C_7 polyol with a capture protein contained in a spotting solution or being present on an array and wherein the covalent binding occurs between an amino group in the capture protein and the reactive group. As amended, Claim 1's use of "capture protein" is consistent with the use of "all said capture proteins" of Claim 17.

Fifth, the Office Action asserts that Claim 21 is confusing because the protein "being present on an array" is inconsistent with step (b)'s reaction with a capture protein. In response, Applicants amend Claim 21 for clarification purposes to recite, in part, contacting a C_5 to C_7 polyol with a capture protein contained in a spotting solution or being present on an array and wherein the covalent binding occurs between an amino group in the capture protein and the reactive group. As amended, Claim 21 recites clearly that a capture protein can be contained in a spotting solution or on an array and the surface of the solid support comprises a reactive group capable reacting with an amino group in the capture protein. Further, as stated in the specification at [00034] and [00047], for example, the polyol can be added to a protein being in an aqueous solution used for subsequent spotting (capture protein contained in a spotting solution) or the polyol can be added to a micro-array onto which proteins have been previously spotted (capture protein contained on an array).

In view of the amendments and for at least the reasons provided above, Applicants respectfully submit that Claims 1, 4-5, 7-9 and 11-21 are sufficiently definite as required under 35 U.S.C. §112, second paragraph, and therefore request that the indefiniteness rejection of Claims 1, 4-5, 7-9 and 11-21 be withdrawn.

In the Office Action, Claims 1, 4-5, 7-9 and 11-21 are rejected to under 35 U.S.C. §103(a) as being unpatentable over either U.S. Publication No. 2003/0175827 to Stillman ("*Stillman*") or GB Patent No. 2,016,687 A to Decker ("*Decker*") in combination with either Guo (Faming Zhuanli Shenqing Gongkai) ("*Guo*") or U.S. Publication No. 2003/0134294 to Sandford ("*Sandford*") and U.S. Publication No. 2004/0198637 to Schultz, et al. ("*Schultz*"). Independent Claims 1 and 21 have been amended to recite, in part, allowing the spotted solution to dry on the support and storing the micro-array between 0 and 8°C or between 15 and 30°C, wherein all said captured proteins have at least 70% of their activity after 6 months of storage. The amendments are supported in the specification at page 7, [00032]; pages 9-10, [00045] and original Claims 11, 12 and 16.

Applicants have found that the use of polyols with spotting solutions for spotting onto a protein micro-array, particularly on specific or pre-determined locations, provides an array having conservation properties over months or even years, enabling a comparison of the quantification between different data obtained from different proteins. See, specification, pages

7-8, [00032-00033]. In particular, the presently amended claims allow for the production of a protein micro-array that conserves at least 70% activity of captured proteins after 6 months storage. As such, Applicants respectfully submit that the cited references are deficient with respect to the present claims.

Applicants submit that the cited references, alone or in combination, fail to disclose or suggest every element of the present claims. For example, *Stillman* and *Decker* fail to disclose or suggest allowing the spotted solution to dry on the support and storing the micro-array between 0 and 8°C or between 15 and 30°C, wherein all said captured proteins have at least 70% of their activity after 6 months of storage as required, in part, by independent Claims 1 and 21. By contrast, *Stillman* teaches drying spotted micro-arrays at 37°C for up to 120 days. See, *Stillman*, page 3, [0027]. *Stillman* further teaches that by using such a temperature, one can extrapolate anticipated shelf life for a dried protein composition. *Id.* As such, *Stillman* does not teach or suggest any storage temperature below 37°C or any storage time approaching the 6 months recited in the claims.

Decker is similarly deficient because it never teaches or suggests storage times of 6 months or the 70% activity of captured proteins as required, in part, by the claims. Further, *Decker* fails to disclose or suggest contacting a C_5 to C_7 polyol with a capture protein contained in a spotting solution or being present on an array, wherein said polyol is between 1.0 and 5.0% of the spotting solution, and wherein the polyol is a linear molecule and is selected from the group consisting of mannitol, maltitol, and sorbitol as required, in part, by independent Claims 1 and 21. While *Decker* does disclose use of mannitol and sorbitol, *Decker* clearly teaches a 10% solution of these polyols, rather than the 1.0-5.0% level required by the claims. See, *Decker*, Table I. Though *Decker* teaches a 5% sucrose solution in Example I and a 5-10% sucrose solution in Example II, one having skill in the art knows that sucrose (table sugar) is clearly different from polyols (sugar alcohols). Therefore, because *Decker* fails to make clear use of a polyol solution within the ranges recited in the claims, *Decker* is deficient with respect to both of the above elements of the present claims.

Applicants submit that secondary references *Guo*, *Sandford* and *Schultz* fail to remedy all the deficiencies of the above references. *Guo* fails to disclose or suggest captured proteins having at least 70% of their activity after 6 months of storage between 0 and 8°C or between 15

and 30°C. If fact, *Guo* does not even mention storage temperatures, storage times or captured protein activities of a protein micro-array. *Guo* also fails to disclose or suggest use of a polyol selected from the group consisting of mannitol, maltitol, and sorbitol. The Office Action asserts, however, that the claimed polyol is included in the C2-C10 aliphatic polyol taught by *Guo*. Applicants respectfully disagree and submit that *Guo* teaches use of a C2-C10 alkyl polyalcohol, which is distinguishable from the polyols recited in the claims. Specifically, alkyl polyalcohols, such as 1-octanol [$CH_3(CH_2)_7OH$]; 1,2-octanediol [$C_8H_{18}O_2$]; or 1,2-hexanediol [$CH_3(CH_2)_3CH(OH)CH_2OH$], are alcohols requiring an alkyl group (CH_3). On the other hand, polyols, specifically the sugar alcohols claimed herein, have a general formula of $H(HCHO)_{n+1}H$, which lacks the alkyl group requirement necessary to be categorized as an alkyl polyalcohol. Moreover, the Office Action's assertion that *Guo* teaches a C2-C10 aliphatic polyol is incorrect because an aliphatic polyol would encompass all polyols that do not contain aromatic rings. As such, the Office Action is broadening the reach of *Guo* rather than properly limiting *Guo* to a small subset of C2-C10 aliphatic polyols, that being C2-C10 alkyl polyalcohols. As properly read, therefore, *Guo* indeed fails to disclose or suggest the use of any of the specific polyols recited in the claims.

Sandford is deficient because it does not even disclose or suggest use of a micro-array maintained in dry conditions as required by the claims. Instead, *Sandford* teaches use of an aqueous array through the preparation of a polyurethane-hydrogel composition. See, *Sandford*, Abstract. As a result, *Sandford* inherently fails to disclose or suggest allowing a spotted solution to dry on a solid support or the subsequent dry storage conditions recited in the claims. By being directed to a wet array, *Sandford* clearly fails to remedy the deficiencies of the primary references. One skilled in the art, moreover, would have no reason to combine *Sandford* (aqueous array) with either of *Stillman* or *Decker* (dry array) because the references are directed to clearly divergent arrays.

Schultz also fails to remedy the deficiencies of the primary references. In fact, the Office Action admits to relying on *Schultz*, not to teach of suggest any of the above deficiencies, but rather for its teaching that covalent or non-covalent linking of proteins in an array does not affect the proteins' activity. See, Office Action, page 11, lines 11-14.

Therefore, Applicants respectfully submit that the cited references, alone or in combination, fail to disclose or suggest every element of the present claims. Accordingly, Applicants requires that the obviousness rejection of Claims 1, 4-5, 7-9 and 11-21 be withdrawn.

For the foregoing reasons, Applicants respectfully request reconsideration of the above-identified patent application and earnestly solicit an early allowance of same.

Respectfully submitted,

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